SCIENTIFIC ACTIVITIES OF THE GOVERNMENT OF BRITISH COLUMBIA 1982-83 SURVEY RESULTS

A REPORT PREPARED BY:
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The following symbols are used in this report:

- \- figures are nil or too small to be expressed
- NA figures are not available or not applicable
- (r) revised figures
- (e) estimated figures

FOREWORD

This is a report on the results of the seventh survey of scientific activities funded by the Government of British Columbia. This year the survey was limited to only those ministries and agencies having expenditures on natural science activities. The report contains 1982-83 (actual) and 1983-84 (estimate) data for these ministries and agencies. We intend to survey ministries with social science activities every second year. For completeness sake, this report includes 1982-83 (estimate) expenditures on social science activities collected during our 1981-82 survey.

The survey was conducted the week of May 30th by Janet Thompson of Statistics Canada with the co-operation and assistance of Dr. M. Cairns, Associate Director, Research Secretariat, Mr. B. Stevenson, Director, Science and Technology, Ministry of Universities, Science and Communications, and Mr. N. Aleksenko, Director of Finance, Ministry of Universities, Science and Communications, and his staff.

Other provinces taking part in these science surveys are Ontario, Saskatchewan and Alberta. Reports for these provinces are available on request from the provincial department sponsoring the survey. National aggregates are published by Statistics Canada in the Canadian Science Indicators (Catalogue No. 88-201) and R & D Expenditures in Canada, 1963-1983.

The 1983 survey of provincial government scientific activities has produced reasonable indicators of scientific involvement at the ministry or agency level. This success is largely due to the goodwill and efforts of officials of the responding ministries. The assistance provided by the Research Secretariat and the Ministry of Universities, Science and Communications is also gratefully acknowledged.

HIGHLIGHTS

During the 1982-83 fiscal year B.C. Government expenditures on scientific activities were equal to $74.1 million. This is 1.0% of the total budgetary expenditures of the government for that year. Compared to 1981-82 there is a slight increase in the expenditures on science activities.

TEXT TABLE I. B.C. Government Expenditures

Ministry	1981-82		1982-83	
	Total estimated expenditures	Total science expenditures	Total estimated expenditures	Total science expenditures
	($ millions)			
Energy, Mines & Petroleum Resources	30.9	4.8	30.1	4.6
Environment	81.0	19.4	85.1	20.5
Forests	162.6	11.2	144.7	11.2
Health(1)	1,975.1	4.8	2,236.6	5.2
Industry & Small Business Development	147.0	8.2	115.6	8.2
Provincial Secretary & Government Services	229.2	5.9	245.1	5.9
Universities, Science & Communications(2)	358.2	8.5	397.3	7.0
Other	3,626.3	10.6	3,977.5	11.5
Total	6,610.3	73.4	7,232.0	74.1(3)

(1) Includes expenditures of the Health Care Research Foundation.
(2) Includes expenditures of the Science Council of B.C.
(3) Includes $23.8 million estimated to be spent on social science activities.

Of the total 1982-83 B.C. Government science expenditures, 68% ($50.2 million) is for natural science activities. Of this, $24.2 million is spent on research and development. The remaining $26.0 million is for related scientific activities. Major support of research and development comes from the Ministries of Forests, the Science Council, the Health Care Research Foundation and Environment. The technical surveys activity is the major related scientific activity, supported mainly by the Ministry of Environment.

It has been estimated that the social sciences, account for 32% ($23.8 million) of the total 1982-83 B.C. Government science expenditure. The principal activity is special services and studies ($13.5 million). The Ministries of Industry & Small Business Development and Provincial Secretary & Government Services are the major supporters of social science activities.

TEXT TABLE II. B.C. Government Expenditures on Science by Activity, 1976-77 to 1982-83

Activity	1976-77(r)	1977-78(r)	1978-79(r)	1979-80(r)	1980-81(r)	1981-82	1982-83
	($ millions)						
R & D	7.1	6.8	9.6	18.0	26.7	26.1	24.5
Education support ...	0.2	0.2	0.3	0.6	0.9	0.8	0.8
Technical surveys ...	5.2	5.8	8.7	12.8	14.8	15.7	17.0
Statistical surveys .	1.3	1.7	2.0	2.4	2.9	3.7	3.7
Information services	2.0	2.7	2.8	3.0	4.9	4.6	5.4
Special services & studies	7.1	11.4	10.5	11.1	17.9	17.4	17.7
Museum services	2.2	2.4	3.0	3.0	3.3	3.5	3.5
Capital expenditures	0.8	1.4	1.2	1.2	1.9	1.5	1.5
Total	25.9	32.4	38.1	52.1	73.3(1)	73.3	74.1

(1) Does not include a one time grant of $14.4 million to the Discovery Foundation nor a $2 million equipment grant to the university sector made by the Ministry of Universities, Science and Communications.

The provincial government itself performed 56% of R & D activities and 78% of related scientific activities in 1982-83. The remainder is performed extramurally. Industry is the largest extramural performer, receiving $9.7 million in support of science. Next is the University sector receiving $5.3 million.

TEXT TABLE III. B.C. Government Expenditures on Science, by Activity and Performer, 1982-83

Activity	Intramural	Industry	Universities	B.C. Research Council	Other	Total
	($ millions)					
Current expenditures:						
R & D	13.6	2.3	5.3	1.2	2.1	24.5
Education support	0.4	-	-	-	0.4	0.8
Technical surveys	15.6	1.3	-	-	0.1	17.0
Statistical surveys	2.2	0.4	-	-	1.1	3.7
Information services	4.6	0.7	-	-	0.1	5.4
Special services & studies	11.3	5.0	-	0.7	0.7	17.7
Museum services	3.5	-	-	-	-	3.5
Sub-total	51.2	9.7	5.3	1.9	4.5	72.6
Capital expenditures	1.5	NA	NA	NA	NA	1.5
Total	52.7	9.7	5.3	1.9	4.5	74.1 (1)

(1) Includes $23.8 million estimated to be spent on social science activities.

Person-years involved in science activities total 1,310. This is approximately 4% of the total B.C. Government person-years. Categories identified are scientific and professional, technical and other.

TEXT TABLE IV. Personnel Engaged in B.C. Government Scientific Activities, by Category and Ministry, 1982-83

Ministry	Scientific and professional	Technical	Other	Total
	person-years			
Attorney General	21	1	6	28
Energy, Mines & Petroleum Resources	47	17	18	82
Environment	109	320	45	474
Forests	101	111	36	248
Health	26	2	33	61
Industry & Small Business Development	63	5	30	98
Provincial Secretary & Government Services	55	85	36	176
Other	80	23	40	143
Total	502	564	244	1,310 (1)

(1) Includes 417 person-years estimated to be engaged in social science activities in 1982-83.

Objectives of natural science expenditures by the B.C. Government are shown in Text Table V. The objective with the largest expenditures in 1982-83 is industrial and economic development. The three major ministries supporting this objective are Forests, Environment, and Energy, Mines and Petroleum Resources. The major areas within industrial and economic development being supported are Forestry ($14.1 million), Fisheries ($4.1 million), Minerals ($2.9 million) and Agriculture ($2.7 million).

TEXT TABLE V. Objectives of B.C. Government Natural Science Expenditures, by Ministry, 1982-83

Ministry	Energy & Fuels	Environmental issues	Health	Industrial & economic development	Social development & related areas	Other	Total
	($ millions)						
Energy, Mines & Petroleum Resources	2.2	-	-	2.4	-	-	4.6
Environment	0.4	7.4	0.1	8.8	3.4	0.4	20.5
Forests	-	-	-	11.1	-	-	11.1
Health(1)	-	-	3.4	-	-	-	3.4
Universities, Science & Communications(2)	0.3	0.1	-	5.7	-	0.9	7.0
Other	-	0.1	-	1.8	1.0	0.7	3.6
Total	2.9	7.6	3.5	29.8	4.4	2.0	50.2

(1) Includes expenditures of the Health Care Research Foundation.
(2) Includes expenditures of the Science Council of B.C.

Natural Sciences

Government of British Columbia

TABLE 1. Total Expenditures in the Natural Sciences, by Activity, 1976-77 to 1983-84

Activity	1976-77 (r)	1977-78 (r)	1978-79 (r)	1979-80 (r)	1980-81 (r)	1981-82	1982-83	1983-84 (e)
	($'000)							
Research & development:								
In-house	3,966	4,366	5,032	5,988	11,427	12,096	12,297	11,083
Contracts	874	733	1,427	3,766	2,184	2,139	1,684	962
Grants	1,538	830	1,836	6,538	26,295 (1)	10,288	8,679	8,525
Research fellowships	-	-	240	460	472	859	1,070	1,100
Sub-total	6,378	5,929	8,535	16,752	40,378	25,382	23,730	21,670
Related scientific activities:								
Education support	101	110	123	179	243	233	166	186
Technical surveys	5,230	5,834	8,709	12,837	14,836	15,689	16,989	16,083
Information services	860	1,419	1,409	1,763	2,404	2,685	3,441	2,920
Special services & studies	2,005	4,686	3,205	2,984	4,413	4,434	4,181	9,461
Museum services	790	886	987	977	1,093	1,015	891	891
Sub-total	8,986	12,935	14,433	18,740	22,989	24,056	25,668	29,541
Capital expenditures:								
Research & development	265	184	351	357	2,276 (2)	296	444	235
Related scientific activities	453	1,104	675	523	766	535	383	206
Sub-total	718	1,288	1,026	880	3,042	831	827	441
Total	16,082	20,152	23,994	36,372	66,409	50,269	50,225	51,652

(1) Includes $14.4 million grant to Discovery Foundation.
(2) Includes $2.0 million research equipment grant to Universities in B.C.

Government of British Columbia

TABLE 2. Total Expenditures in the Natural Sciences, by Ministry or Agency, 1976-77 to 1983-84

Ministry or Agency	1976-77 (r)	1977-78 (r)	1978-79 (r)	1979-80 (r)	1980-81 (r)	1981-82	1982-83	1983-84 (e)
	($'000)							
Agriculture	652	788	1,243	1,519	1,558	1,785	1,760	1,660
Economic Development	320	320	320	NA	NA	NA	NA	NA
Education, Science & Technology	NA	NA	724	NA	NA	NA	NA	NA
Energy, Mines & Petroleum Resources	NA	NA	2,469	3,863	4,493	4,845	4,637	9,801
Energy, Transport & Communications	NA	951	NA	NA	NA	NA	NA	NA
Environment	5,912	8,074	9,525	14,886	18,280	19,304	20,456	19,015
Forests	3,165	4,087	6,127	7,318	13,240	10,937	11,097	9,231
Health	368	384	-	83	43	65	25	25
Health Care Research Foundation	NA	NA	1,332	3,449	3,556	3,033	3,372	3,500
Highways	242	292	NA	NA	NA	NA	NA	NA
Industry & Small Business Development	NA	NA	NA	420	-	-	-	-
Lands, Parks & Housing	NA	NA	100	76	104	12	321	271
Mines & Petroleum Resources	2,281	2,318	NA	NA	NA	NA	NA	NA
Municipal Affairs & Housing	750	105	NA	NA	NA	NA	NA	NA
Provincial Secretary & Government Services	NA	NA	1,460	1,480	1,640	1,640	1,390	1,390
Provincial Secretary & Travel Industry	1,287	1,352	NA	NA	NA	NA	NA	NA
Recreation & Conservation	1,105	1,481	NA	NA	NA	NA	NA	NA
Science Council of B.C.	NA	NA	NA	NA	5,000	5,840	4,209	4,002
Transportation, Communications & Highways	NA	NA	694	NA	NA	NA	NA	NA
Transportation & Highways	NA	NA	NA	202	120	151	173	135
Universities, Science & Communications	NA	NA	NA	3,076	18,375 (1)	2,657	2,785	2,622
Total	16,082	20,152	23,994	36,372	66,409	50,269	50,225	51,652

(1) Includes $14.4 million grant to Discovery Foundation.

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TABLE 3. Total Expenditures in the Natural Sciences, by Performer, 1976-77 to 1983-84

Performer	1976-77 (r)	1977-78 (r)	1978-79 (r)	1979-80 (r)	1980-81 (r)	1981-82	1982-83	1983-84 (e)
	($'000)							
Intramural	13,536	17,432	19,089	25,092	33,999	33,532	35,825	32,867
Industry	822	1,150	1,651	4,340	5,421	6,066	5,045	10,391
Universities	877	770	1,651	5,517	9,129	6,138	5,270	4,889
Hospitals & health organizations	-	-	123	164	279	124	203	200
B.C. Research Council ..	351	328	320	627	1,874	1,914	1,789	1,697
Other	496	472	1,160	632	15,707 (1)	2,495	2,093	1,608
Total	16,082	20,152	23,994	36,372	66,409	50,269	50,225	51,652

(1) Includes $14.4 million grant to Discovery Foundation.

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TABLE 4. Current Expenditures on R & D in the Natural Sciences, by Performer, 1976-77 to 1983-84

Performer	1976-77 (r)	1977-78 (r)	1978-79 (r)	1979-80 (r)	1980-81 (r)	1981-82	1982-83	1983-84 (e)
	($'000)							
Intramural	4,101	4,499	5,331	6,918	12,004	12,732	12,821	11,520
Industry	767	78	451	3,366	2,147	2,938	2,299	2,460
Universities	839	670	1,485	5,482	9,061	6,127	5,270	4,889
Hospitals & health organizations	-	-	123	164	279	124	203	200
B.C. Research Council .	351	320	320	627	1,874	1,494	1,227	1,163
Other	320	362	825	195	15,013 (1)	1,967	1,910	1,438
Total	6,378	5,929	8,535	16,752	40,378	25,382	23,730	21,670

(1) Includes $14.4 million grant to Discovery Foundation.

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TABLE 5. Current Expenditures on R & D in the Natural Sciences, by Ministry or Agency, 1976-77 to 1983-84

Ministry or Agency	1976-77 (r)	1977-78 (r)	1978-79 (r)	1979-80 (r)	1980-81 (r)	1981-82	1982-83	1983-84 (e)
	($'000)							
Agriculture	225	120	531	682	682	831	577	560
Economic Development	320	320	320	NA	NA	NA	NA	NA
Education, Science & Technology	NA	NA	424	NA	NA	NA	NA	NA
Energy, Mines & Petroleum Resources	NA	NA	905	2,387	1,479	1,370	1,290	1,163
Energy, Transport & Communications	NA	-	NA	NA	NA	NA	NA	NA
Environment	145	220	1,106	1,865	2,160	2,170	2,214	2,090
Forests	2,505	2,989	3,376	4,364	8,846	9,626	9,492	7,847
Health	334	350	-	83	43	5	5	-
Health Care Research Foundation	NA	NA	1,332	3,449	3,556	3,033	3,372	3,500
Highways	125	195	NA	NA	NA	NA	NA	NA
Industry & Small Business Development	NA	NA	NA	420	-	-	-	-
Lands, Parks & Housing	NA	NA	-	-	-	-	5	-
Mines & Petroleum Resources	1,074	911	NA	NA	NA	NA	NA	NA
Municipal Affairs & Housing	750	30	NA	NA	NA	NA	NA	NA
Provincial Secretary & Government Services	NA	NA	360	380	420	420	410	410
Provincial Secretary & Travel Industry	319	335	NA	NA	NA	NA	NA	NA
Recreation & Conservation	581	459	NA	NA	NA	NA	NA	NA
Science Council of B.C.	NA	NA	NA	NA	5,000	5,840	4,209	4,002
Transportation, Communications & Highways	NA	NA	181	NA	NA	NA	NA	NA
Transportation & Highways	NA	NA	NA	52	48	54	48	35
Universities, Science & Communications	NA	NA	NA	3,070	18,144 (1)	2,033	2,108	2,063
Total	6,378	5,929	8,535	16,752	40,378	25,382	23,730	21,670

(1) Includes $14.4 million grant to Discovery Foundation.

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TABLE 6. Ministerial Personnel Engaged in Scientific Activities in the Natural Sciences, by Activity and Category, 1976-77 to 1983-84

Activity and Category	1976-77 (r)	1977-78 (r)	1978-79 (r)	1979-80 (r)	1980-81 (r)	1981-82	1982-83	1983-
	(person-years)							
Research & development:								
Scientific & professional	67	72	81	110	132	134	147	145
Technical	61	61	66	71	144	148	135	131
Other	36	35	36	47	30	42	40	42
Sub-total	164	168	183	228	306	324	322	318
Related scientific activities:								
Scientific & professional	145	182	178	187	144	162	143	139
Technical	197	286	302	365	399	410	346	332
Other	71	93	89	93	81	84	82	77
Sub-total	413	561	569	645	624	656	571	548
Total natural science activities:								
Scientific & professional.....	212	254	259	297	276	296	290	284
Technical	258	347	368	436	543	558	481	463
Other	107	128	125	140	111	126	122	119
Total	577	729	752	873	930	980	893	866

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TABLE 7. Total Expenditures in the Natural Sciences, by Sources of Funds, 1982-83

Ministry or Agency	Ministerial budget	Transfers from other ministries	Transfers from federal government	From other sources	Total
	($'000)				
Agriculture & Food	1,535	-	225	-	1,760
Energy, Mines & Petroleum Resources	3,858	-	779	-	4,637
Environment	20,000	314	60	82	20,456
Forests	3,468	148	110	7,371	11,097
Health	25	-	-	-	25
Health Care Research Foundation	-	-	-	3,372 (1)	3,372
Lands, Parks & Housing	321	-	-	-	321
Provincial Secretary & Government Services	1,390	-	-	-	1,390
Science Council of B.C.	-	4,209 (2)	-	-	4,209
Transportation & Highways	173	-	-	-	173
Universities, Science & Communications	2,785	-	-	-	2,785
Total	33,555	4,671	1,174	10,825	50,225

(1) Transferred from the B.C. Lotteries Fund.
(2) Transferred from the Ministry of Universities, Science and Communications.

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TABLE 8. Total Expenditures in the Natural Sciences, by Activity and Performer, 1982-83

Activity	Intramural	Industry	Universities	Hospitals & health organizations	B.C. Research Council	Other	Total
	($'000)						
Research & development:							
In-house	12,297	NA	NA	NA	NA	NA	12,297
Contracts	41	457	290	-	-	896	1,684
Grants	483	1,806	3,946	203	1,227	1,014	8,679
Research fellowships	-	36	1,034	-	-	-	1,070
Sub-total	12,821	2,299	5,270	203	1,227	1,910	23,730
Related scientific activities:							
Education support	136	-	-	-	-	30	166
Technical surveys	15,622	1,314	-	-	-	53	16,989
Information services	3,371	10	-	-	-	60	3,441
Special services & studies	2,157	1,422	-	-	562	40	4,181
Museum services	891	-	-	-	-	-	891
Sub-total	22,177	2,746	-	-	562	183	25,668
Capital expenditures:							
Research & development	444	NA	NA	NA	NA	NA	444
Related scientific activities	383	NA	NA	NA	NA	NA	383
Sub-total	827	NA	NA	NA	NA	NA	827
Total	35,825	5,045	5,270	203	1,789	2,093	50,225

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TABLE 9. Total Expenditures in the Natural Sciences, by Ministry or Agency and Performer, 1982-83

Ministry or Agency	Intramural	Industry	Universities	Hospitals & health organizations	B.C. Research Council	Other	Total
	($'000)						
Agriculture & Food	1,183	435	133	-	-	9	1,760
Energy, Mines & Petroleum Resources	3,099	1,355	-	-	-	183	4,637
Environment	19,060	1,386	10	-	-	-	20,456
Forests	9,894	27	280	-	-	896	11,097
Health	25	-	-	-	-	-	25
Health Care Research Foundation	87	15	3,067	203	-	-	3,372
Lands, Parks & Housing	316	-	-	-	-	5	321
Provincial Secretary & Government Services	1,390	-	-	-	-	-	1,390
Science Council of B.C. ...	375	1,827	1,780	-	227	-	4,209
Transportation & Highways .	173	-	-	-	-	-	173
Universities, Science & Communications(1)	223	-	-	-	1,562	1,000	2,785
Total	35,825	5,045	5,270	203	1,789 -	2,093	50,225

(1) Excludes $4.2 million granted to the Science Council of B.C.

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TABLE 10. Current Expenditures in the Natural Sciences, by Ministry or Agency and Activity, 1982-83

Ministry or Agency	Research & development	Education support	Technical surveys	Information services	Special services & studies	Museum services	Total
	($'000)						
Agriculture & Food	577	-	-	1,102	81	-	1,760
Energy, Mines & Petroleum Resources	1,290	60	1,067	547	1,666	7	4,637
Environment	2,214	-	15,146	1,483	1,169	2	20,014
Forests	9,492	-	581	111	539	-	10,723
Health	5	-	-	-	20	-	25
Health Care Research Foundation	3,372	-	-	-	-	-	3,372
Lands, Parks & Housing	5	16	195	12	-	82	310
Provincial Secretary & Government Services	410	90	-	90	-	800	1,390
Science Council of B.C. ...	4,209	-	-	-	-	-	4,209
Transportation & Highways .	48	-	-	-	125	-	173
Universities, Science & Communications	2,108	-	-	96	581	-	2,785
Total	23,730	166	16,989	3,441	4,181	891	49,398

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TABLE 11. Current Expenditures on R & D in the Natural Sciences, by Ministry or Agency and Performer, 1982-83

Ministry or Agency	Intramural	Industry	Universities	Hospitals & health organizations	B.C. Research Council	Other	Total
	($'000)						
Agriculture & Food	-	435	133	-	-	9	577
Energy, Mines & Petroleum Resources	1,290	-	-	-	-	-	1,290
Environment	2,190	14	10	-	-	-	2,214
Forests	8,308	8	280	-	-	896	9,492
Health	5	-	-	-	-	-	5
Health Care Research Foundation	87	15	3,067	203	-	-	3,372
Lands, Parks & Housing	-	-	-	-	-	5	5
Provincial Secretary & Government Services	410	-	-	-	-	-	410
Science Council of B.C.	375	1,827	1,780	-	227	-	4,209
Transportation & Highways ..	48	-	-	-	-	-	48
Universities, Science & Communications	108	-	-	-	1,000	1,000	2,108
Total	12,821	2,299	5,270	203	1,227	1,910	23,730

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TABLE 12. Detail of Intramural Expenditures in the Natural Sciences, 1982-83

Ministry or Agency	Current expenditures		Capital expenditures	Total
	Personnel costs	Other costs		
	($'000)			
Agriculture & Food	948	235	-	1,183
Energy, Mines & Petroleum Resources	2,393	706	-	3,099
Environment	13,638	4,980	442	19,060
Forests	7,336	2,184	374	9,894
Health	20	5	-	25
Health Care Research Foundation	-	87	-	87
Lands, Parks & Housing	206	99	11	316
Provincial Secretary & Government Services	1,300	90	-	1,390
Science Council of B.C.	228	147	-	375
Transportation & Highways	168	5	-	173
Universities, Science & Communications	42	181	-	223
Total	26,279	8,719	827	35,825

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TABLE 13. Ministerial Personnel Engaged in Scientific Activities in the Natural Sciences, by Ministry or Agency, 1982-83

Ministry or Agency	Research & development				Related scientific activities			
	Scientific & professional	Technical	Other	Total	Scientific & professional	Technical	Other	Total
	(person-years)							
Agriculture & Food	-	-	-	-	9	11	15	35
Energy, Mines & Petroleum Resources	18	5	1	24	29	12	17	58
Environment	29	34	5	68	79	286	40	405
Forests	89	91	31	211	11	19	3	33
Health	-	-	-	-	1	-	-	1
Health Care Research Foundation	-	-	-	-	-	-	-	-
Lands, Parks & Housing ...	-	-	-	-	5	2	-	7
Provincial Secretary & Government Services	4	4	-	8	7	15	7	29
Science Council of B.C. ..	6	-	3	9	-	-	-	-
Transportation & Highways	-	1	-	1	2	1	-	3
Universities, Science & Communications	1	-	-	1	-	-	-	-
Total	147	135	40	322	143	346	82	571

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TABLE 14. Objectives of Expenditures in the Natural Sciences, by Ministry or Agency, 1982-83

Ministry or Agency	Advancement of science	Communications	Energy & fuels			Environmental issues	Health
			Fossil fuels	Hydro electric energy	Other		
	($'000)						
Agriculture & Food	-	-	-	-	-	-	-
Energy, Mines & Petroleum Resources	-	-	545	-	1,694	-	-
Environment	112	-	262	157	-	7,383	140
Forests	-	-	-	-	-	-	-
Health	-	-	-	-	-	-	25
Health Care Research Foundation	-	-	-	-	-	-	3,372
Lands, Parks & Housing	113	-	-	-	-	147	-
Provincial Secretary & Government Services	410	-	-	-	-	-	-
Science Council of B.C.	-	25	147	101	-	84	-
Transportation & Highways ..	-	-	-	-	-	-	-
Universities, Science & Communications	204	100	-	-	-	-	-
Total	839	125	954	258	1,694	7,614	3,537

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TABLE 14. Objectives of Expenditures in the Natural Sciences, by Ministry or Agency, 1982-83 - Continued

Ministry or Agency	Industrial & economic development					
	Agriculture	Fisheries	Forestry	Manufacturing	Minerals	Other
	($'000)					
Agriculture & Food	1,760	-	-	-	-	-
Energy, Mines & Petroleum Resources	-	-	-	-	2,398	-
Environment	405	2,917	1,594	-	262	3,573
Forests	-	-	11,066	-	-	31
Health	-	-	-	-	-	-
Health Care Research Foundation	-	-	-	-	-	-
Lands, Parks & Housing	-	-	-	-	-	61
Provincial Secretary & Government Services	-	-	-	-	-	-
Science Council of B.C.	307	548	1,473	1,262	232	-
Transportation & Highways	-	-	-	-	-	-
Universities, Science & Communications	220	640	-	1,000	-	50
Total	2,692	4,105	14,133	2,262	2,892	3,715

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TABLE 14. Objectives of Expenditures in the Natural Sciences, by Ministry or Agency, 1982-83 - Concluded

Ministry or Agency	Social development & related areas		Transportation	Other	Total
	Culture, sport & recreation	Urban & regional studies			
	($'000)				
Agriculture & Food	-	-	-	-	1,760
Energy, Mines & Petroleum Resources	-	-	-	-	4,637
Environment	525	2,863	263	-	20,456
Forests	-	-	-	-	11,097
Health	-	-	-	-	25
Health Care Research Foundation	-	-	-	-	3,372
Lands, Parks & Housing	-	-	-	-	321
Provincial Secretary & Government Services	980	-	-	-	1,390
Science Council of B.C. ...	-	-	30	-	4,209
Transportation & Highways .	-	-	173	-	173
Universities, Science & Communications	-	-	9	562	2,785
Total	1,505	2,863	475	562	50,225

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TABLE 15. Objectives of Expenditures in the Natural Sciences, by Objective and Activity, 1982-83

Objective	Intramural		Extramural		Total
	Research & development	Related scientific activities	Research & development	Related scientific activities	
	($'000)				
Advancement of science	518	316	5	-	839
Communications	2	-	123	-	125
Energy & fuels:					
Fossil fuels	13	757	134	50	954
Hydro electric energy	9	157	92	-	258
Other	-	206	-	1,488	1,694
Environmental issues	690	6,823	101	-	7,614
Health	92	160	3,285	-	3,537
Industrial & economic development:					
Agriculture	27	1,588	1,077	-	2,692
Fisheries	1,006	1,902	1,139	58	4,105
Forestry	8,809	2,806	2,499	19	14,133
Manufacturing	112	-	2,150	-	2,262
Minerals	1,311	1,370	211	-	2,892
Other	625	2,999	66	25	3,715
Social development & related areas:					
Culture, sport & recreation	-	1,505	-	-	1,505
Urban & regional studies	-	1,574	-	1,289	2,863
Transportation	51	397	27	-	475
Other	-	-	-	562	562
Total	13,265	22,560	10,909	3,491	50,225

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TABLE 16. Total Expenditures in the Natural Sciences, by Activity and Performer, 1983-84(e)

Activity	Intramural	Industry	Universities	Hospitals & health organizations	B.C. Research Council	Other	Total
	($'000)						
Research & development:							
In-house	11,083	NA	NA	NA	NA	NA	11,083
Contracts	18	504	62	-	-	378	962
Grants	419	1,806	3,877	200	1,163	1,060	8,525
Research fellowships	-	150	950	-	-	-	1,100
Sub-total	11,520	2,460	4,889	200	1,163	1,438	21,670
Related scientific activities:							
Education support	136	-	-	-	-	50	186
Technical surveys	14,870	1,213	-	-	-	-	16,083
Information services	2,820	-	-	-	-	100	2,920
Special services & studies	2,189	6,718	-	-	534	20	9,461
Museum services	891	-	-	-	-	-	891
Sub-total	20,906	7,931	-	-	534	170	29,541
Capital expenditures:							
Research & development	235	NA	NA	NA	NA	NA	235
Related scientific activities	206	NA	NA	NA	NA	NA	206
Sub-total	441	NA	NA	NA	NA	NA	441
Total	32,867	10,391	4,889	200	1,697	1,608	51,652

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TABLE 17. Total Expenditures in the Natural Sciences, by Ministry or Agency and Performer, 1983-84(e)

Ministry or Agency	Intramural	Industry	Universities	Hospitals & health organizations	B.C. Research Council	Other	Total
	($'000)						
Agriculture & Food	1,100	400	150	-	-	10	1,660
Energy, Mines & Petroleum Resources	2,833	6,818	-	-	-	150	9,801
Environment	17,788	1,217	10	-	-	-	19,015
Forests	8,781	-	52	-	-	398	9,231
Health	25	-	-	-	-	-	25
Health Care Research Foundation	100	100	3,100	200	-	-	3,500
Lands, Parks & Housing	271	-	-	-	-	-	271
Provincial Secretary & Government Services	1,390	-	-	-	-	-	1,390
Science Council of B.C	356	1,856	1,577	-	213	-	4,002
Transportation & Highways .	135	-	-	-	-	-	135
Universities, Science & Communications	88	-	-	-	1,484	1,050	2,622
Total	32,867	10,391	4,889	200	1,697	1,608	51,652

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TABLE 18. Current Expenditures in the Natural Sciences, by Ministry or Agency and Activity, 1983-84(e)

Ministry or Agency	Research & development	Education support	Technical surveys	Information services	Special services & studies	Museum services	Total
	($'000)						
Agriculture & Food	560	-	-	1,015	85	-	1,660
Energy, Mines & Petroleum Resources	1,163	80	976	575	7,000	7	9,801
Environment	2,090	-	14,324	1,159	1,224	2	18,799
Forests	7,847	-	628	73	468	-	9,016
Health	-	-	-	-	25	-	25
Health Care Research Foundation	3,500	-	-	-	-	-	3,500
Lands, Parks & Housing	-	16	155	8	-	82	261
Provincial Secretary & Government Services	410	90	-	90	-	800	1,390
Science Council of B.C. ...	4,002	-	-	-	-	-	4,002
Transportation & Highways .	35	-	-	-	100	-	135
Universities, Science & Communications	2,063	-	-	-	559	-	2,622
Total	21,670	186	16,083	2,920	9,461	891	51,211

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TABLE 19. Current Expenditures on R & D in the Natural Sciences, by Ministry or Agency and Performer, 1983-84(e)

Ministry or Agency	Intramural	Industry	Universities	Hospitals & health organizations	B.C. Research Council	Other	Total
	($'000)						
Agriculture & Food	-	400	150	-	-	10	560
Energy, Mines & Petroleum Resources	1,153	10	-	-	-	-	1,163
Environment	1,986	94	10	-	-	-	2,090
Forests	7,417	-	52	-	-	378	7,847
Health	-	-	-	-	-	-	-
Health Care Research Foundation	100	100	3,100	200	-	-	3,500
Lands, Parks & Housing	-	-	-	-	-	-	-
Provincial Secretary & Government Services	410	-	-	-	-	-	410
Science Council of B.C.	356	1,856	1,577	-	213	-	4,002
Transportation & Highways ..	35	-	-	-	-	-	35
Universities, Science & Communications	63	-	-	-	950	1,050	2,063
Total	11,520	2,460	4,889	200	1,163	1,438	21,670

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TABLE 20. Ministerial Personnel Engaged in Scientific Activities in the Natural Sciences, by Ministry or Agency, 1983-84 (e)

Ministry or Agency	Research & development				Related scientific activities			
	Scientific & professional	Technical	Other	Total	Scientific & professional	Technical	Other	Total
	(person-years)							
Agriculture & Food	-	-	-	-	7	10	13	30
Energy, Mines & Petroleum Resources	17	5	1	23	28	11	17	56
Environment	27	30	5	62	80	273	38	391
Forests	89	91	31	211	10	19	2	31
Health	-	-	-	-	1	-	-	1
Health Care Research Foundation	-	-	-	-	-	-	-	-
Lands, Parks & Housing	-	-	-	-	4	3	-	7
Provincial Secretary & Government Services	4	4	-	8	7	15	7	29
Science Council of B.C.	7	-	4	11	-	-	-	-
Transportation & Highways	-	1	-	1	2	1	-	3
Universities, Science & Communications	1	-	1	2	-	-	-	-
Total	145	131	42	318	139	332	77	548

Social Sciences and Humanities

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TABLE 21. Total Expenditures in the Social Sciences and Humanities, by Activity, 1976-77 to 1982-83

Activity	1976-77	1977-78	1978-79(r)	1979-80(r)	1980-81(r)	1981-82	1982-83(e)
	($'000)						
Research & development:							
In-house	689	741	972	1,094	713	730	732
Contracts	47	98	79	83	10	10	10
Grants	-	30	30	30	21	20	-
Sub-total	736	869	1,081	1,207	744	760	742
Related scientific activities:							
Education support	94	127	189	438	638	611	672
Statistical surveys	1,272	1,667	2,049	2,390	2,870	3,698	3,674
Information services	1,106	1,231	1,396	1,258	2,527	1,934	1,988
Special services & studies	5,121	6,730	7,235	8,174	13,466	12,941	13,456
Museum services	1,438	1,535	2,034	1,987	2,235	2,467	2,621
Sub-total	9,031	11,290	12,903	14,247	21,736	21,651	22,411
Capital expenditures:						-	
Research & development	-	11	18	15	20	20	20
Related scientific activities	137	54	144	282	866	691	655
Sub-total	137	65	162	297	886	711	675
Total	9,904	12,224	14,146	15,751	23,366	23,122	23,828

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TABLE 22. Total Expenditures in the Social Sciences and Humanities, by Ministry, 1976-77 to 1982-83

Ministry	1976-77	1977-78	1978-79(r)	1979-80(r)	1980-81(r)	1981-82	1982-83(e)
	($'000)						
Attorney General	740	671	910	1,015	1,280	1,330	1,369
Consumer & Corporate Affairs	231	214	356	469	443	616	562
Economic Development	1,867	3,172	3,625	NA	NA	NA	NA
Education	1,599	2,113	NA	1,727	1,767	1,907	1,897
Education, Science & Technology	NA	NA	1,999	NA	NA	NA	NA
Energy, Mines & Petroleum Resources	NA	NA	254	238	-	-	-
Energy, Transport & Communications	489	489	NA	NA	NA	NA	NA
Environment	158	169	221	372	10	65	90
Finance	20	30	40	115	1,299	2,052	2,277
Forests	121	20	12	22	91	233	142
Health	749	868	1,217	1,674	1,475	1,686	1,755
Highways	25	26	NA	NA	NA	NA	NA
Human Resources	67	NA	140	NA	NA	NA	NA
Industry & Small Business Development	NA	NA	NA	5,107	11,037	8,240	8,240
Labour	607	701	392	508	564	1,208	1,236
Lands, Parks & Housing	NA	NA	235	309	270	192	225
Mines & Petroleum Resources	NA	119	NA	NA	NA	NA	NA
Municipal Affairs	NA	NA	424	497	539	274	351
Municipal Affairs & Housing	195	412	NA	NA	NA	NA	NA
Provincial Secretary & Government Services	NA	NA	3,627	3,508	3,978	4,257	4,471
Provincial Secretary & Travel Industry	2,181	2,354	NA	NA	NA	NA	NA
Recreation & Conservation ..	855	866	NA	NA	NA	NA	NA
Tourism	NA	NA	NA	72	181	261	300
Tourism & Small Business Dev	NA	NA	570	NA	NA	NA	NA
Transportation, Communications & Highways	NA	NA	124	NA	NA	NA	NA
Transportation & Highways ..	NA	NA	NA	118	432	801	913
Total	9,904	12,224	14,146	15,751	23,366	23,122	23,828

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TABLE 23. Total Expenditures in the Social Sciences and Humanities, by Performer, 1976-77 to 1982-83

Performer	1976-77	1977-78	1978-79(r)	1979-80(r)	1980-81(r)	1981-82	1982-83(e)
	($'000)						
Intramural	7,305	7,728	9,385	10,541	13,429	16,262	16,859
Industry	882	2,179	2,375	3,266	8,131	4,419	4,652
Universities	574	635	275	120	85	69	51
Hospitals and health organizations	-	45	62	65	45	49	54
B.C. Research Council	110	297	17	-	49	91	106
Other	1,033	1,340	2,032	1,759	1,627	2,232	2,106
Total	9,904	12,224	14,146	15,751	23,366	23,122	23,828

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TABLE 24. Current Expenditures on R & D in the Social Sciences and Humanities, by Performer, 1976-77 to 1982-83

Performer	1976-77	1977-78	1978-79(r)	1979-80(r)	1980-81(r)	1981-82	1982-83(e)
	($'000)						
Intramural	699	751	982	1,104	723	740	742
Industry	28	62	12	56	-	-	-
Universities	7	35	30	30	21	20	-
Hospitals and health organizations	-	-	-	-	-	-	-
B.C. Research Council	-	-	-	-	-	-	-
Other	2	21	57	17	-	-	-
Total	736	869	1,081	1,207	744	760	742

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TABLE 25. Current Expenditures on R & D in the Social Sciences and Humanities, by Ministry 1976-77 to 1982-83

Ministry	1976-77	1977-78	1978-79(r)	1979-80(r)	1980-81(r)	1981-82	1982-83(e)
	($'000)						
Attorney General	90	149	233	235	153	162	173
Consumer & Corporate Affairs	30	8	-	-	-	-	-
Economic Development	10	98	50	NA	NA	NA	NA
Education	-	3	NA	-	-	-	-
Energy, Mines & Petroleum Resources	NA	NA	-	56	-	-	-
Environment	15	-	-	-	-	-	-
Forests	7	-	-	-	-	-	-
Health	60	140	291	456	121	132	97
Highways	5	24	NA	NA	NA	NA	NA
Human Resources	51	NA	97	NA	NA	NA	NA
Industry & Small Business Development	NA	NA	NA	50	20	-	-
Mines & Petroleum Resources	NA	46	NA	NA	NA	NA	NA
Municipal Affairs	NA	NA	-	-	-	16	22
Municipal Affairs & Housing	111	27	NA	NA	NA	NA	NA
Provincial Secretary & Government Services	NA	NA	410	410	450	450	450
Provincial Secretary & Travel Industry	357	374	NA	NA	NA	NA	NA
Total	736	869	1,081	1,207	744	760	742

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TABLE 26. Ministerial Personnel Engaged in Scientific Activities in the Social Sciences and Humanities, by Activity and by Category, 1976-77 to 1982-83

Activity and Category	1976-77	1977-78	1978-79(r)	1979-80(r)	1980-81(r)	1981-82	1982-83(e)
	(person-years)						
Research & development:							
Scientific & professional	16	15	25	26	15	20	19
Technical	8	6	9	8	6	6	6
Other	4	7	9	12	4	3	2
Sub-total	28	28	43	46	25	29	27
Related scientific activities:							
Scientific & professional	163	162	170	168	192	203	193
Technical	76	61	62	85	80	79	77
Other	96	101	103	100	118	131	120
Sub-total	335	324	335	353	390	413	390
Total social science activities:							
Scientific & professional.....	179	177	195	194	207	223	212
Technical	84	67	71	93	86	85	83
Other	100	108	112	112	122	134	122
Total	363	352	378	399	415	442	417

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TABLE 27. Total Expenditures in the Social Sciences and Humanities, by Activity and Performer, 1982-83(e)

Activity	Intramural	Industry	Universities	Hospitals & health organizations	B.C. Research Council	Other	Total
	($'000)						
Research & development:							
In-house	732	NA	NA	NA	NA	NA	732
Contracts	10	-	-	-	-	-	10
Grants	-	-	-	-	-	-	-
Sub-total	742	-	-	-	-	-	742
Related scientific activities:							
Education support	322	-	-	-	-	350	672
Statistical surveys	2,164	387	-	-	-	1,123	3,674
Information services	1,229	723	-	-	16	20	1,988
Special services & studies	9,139	3,542	51	54	90	580	13,456
Museum services	2,588	-	-	-	-	33	2,621
Sub-total	15,442	4,652	51	54	106	2,106	22,411
Capital expenditures:							
Research & development	20	NA	NA	NA	NA	NA	20
Related scientific activities	655	NA	NA	NA	NA	NA	655
Sub-total	675	NA	NA	NA	NA	NA	675
Total	16,859	4,652	51	54	106	2,106	23,828

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TABLE 28. Total Expenditures in the Social Sciences and Humanities, by Ministry and Performer, 1982-83(e)

Ministry	Intramural	Industry	Universities	Hospitals & health organizations	B.C. Research Council	Other	Total
	($'000)						
Attorney General	1,369	-	-	-	-	-	1,369
Consumer & Corporate Affairs	432	30	-	-	-	100	562
Education	379	37	12	-	16	1,453	1,897
Environment	30	-	-	-	-	60	90
Finance	2,277	-	-	-	-	-	2,277
Forests	142	-	-	-	-	-	142
Health	1,701	-	-	54	-	-	1,755
Industry & Small Business Development.....	4,270	3,445	5	-	40	480	8,240
Labour	1,236	-	-	-	-	-	1,236
Lands, Parks & Housing.....	65	160	-	-	-	-	225
Municipal Affairs	301	50	-	-	-	-	351
Provincial Secretary & Government Services.....	4,437	-	34	-	-	-	4,471
Tourism	220	17	-	-	50	13	300
Transportation & Highways ..	-	913	-	-	-	-	913
Total	16,859	4,652	51	54	106	2,106	23,828

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TABLE 29. Current Expenditures in the Social Sciences and Humanities, by Ministry and Activity, 1982-83(e)

Ministry	Research & development	Education support	Statistical surveys	Information services	Special services & studies	Museum services	Total
	($'000)						
Attorney General	173	44	20	79	1,003	-	1,319
Consumer & Corporate Affairs	-	17	30	55	460	-	562
Education	-	486	1,140	74	164	33	1,897
Environment	-	-	90	-	-	-	90
Finance	-	-	-	-	2,277	-	2,277
Forests	-	-	82	-	60	-	142
Health	97	-	487	40	1,131	-	1,755
Industry & Small Business Development .	-	15	1,095	1,065	5,525	-	7,700
Labour	-	-	645	205	386	-	1,236
Lands, Parks & Housing .	-	-	-	115	110	-	225
Municipal Affairs	22	-	15	15	299	-	351
Provincial Secretary & Government Services ..	450	110	-	222	1,016	2,588	4,386
Tourism	-	-	70	10	220	-	300
Transportation & Highways	-	-	-	108	805	-	913
Total	742	672	3,674	1,988	13,456	2,621	23,153

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TABLE 30. Current Expenditures on R & D in the Social Sciences and Humanities, by Ministry and Performer, 1982-83(e)

Ministry	Intramural	Industry	Universities	Hospitals & health organizations	B.C. Research Council	Other	Total
	($'000)						
Attorney General	173	-	-	-	-	-	173
Consumer & Corporate Affairs	-	-	-	-	-	-	-
Education	-	-	-	-	-	-	-
Environment	-	-	-	-	-	-	-
Finance	-	-	-	-	-	-	-
Forests	-	-	-	-	-	-	-
Health	97	-	-	-	-	-	97
Industry & Small Business Development.....	-	-	-	-	-	-	-
Labour	-	-	-	-	-	-	-
Lands, Parks & Housing.....	-	-	-	-	-	-	-
Municipal Affairs	22	-	-	-	-	-	22
Provincial Secretary & Government Services.....	450	-	-	-	-	-	450
Tourism	-	-	-	-	-	-	-
Transportation & Highways ...	-	-	-	-	-	-	-
Total	742	-	-	-	-	-	742

Government of British Columbia

TABLE 31. Ministerial Personnel Engaged in Scientific Activities in the Social Sciences and Humanities, by Ministry, 1982-83(e)

Ministry	Research & development				Related scientific activities			
	Scientific & professional	Technical	Other	Total	Scientific & professional	Technical	Other	Total
	(person-years)							
Attorney General	8	-	1	9	13	1	5	19
Consumer & Corporate Affairs	-	-	-	-	11	-	5	16
Education	-	-	-	-	8	-	-	8
Environment	-	-	-	-	1	-	-	1
Finance	-	-	-	-	23	6	5	34
Forests	-	-	-	-	1	1	2	4
Health	4	-	1	5	21	2	32	55
Industry & Small Business Development	-	-	-	-	63	5	30	98
Labour	-	-	-	-	6	2	8	16
Lands, Parks & Housing	-	-	-	-	1	-	1	2
Municipal Affairs	1	-	-	1	4	-	2	6
Provincial Secretary & Government Services	6	6	-	12	38	60	29	127
Tourism	-	-	-	-	3	-	1	4
Transportation & Highways	-	-	-	-	-	-	-	-
Total	19	6	2	27	193	77	120	390

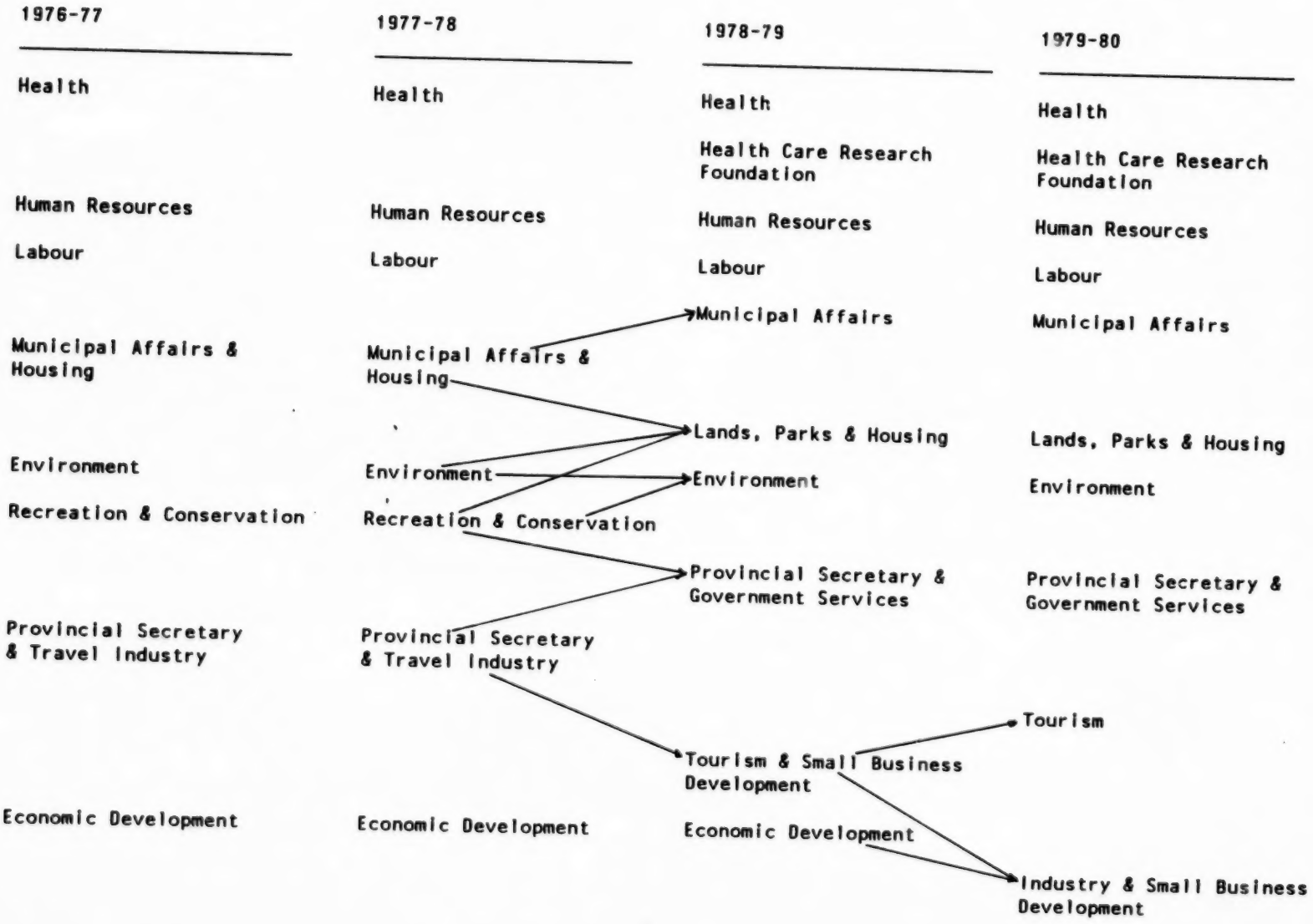
APPENDIX

B.C. Ministries included in the Provincial Government Science Survey

1976-77	1977-78	1978-79	1979-80
Agriculture	Agriculture	Agriculture	Agriculture
Attorney General	Attorney General	Attorney General	Attorney General
Consumer & Corporate Affairs	Consumer & Corporate Affairs	Consumer & Corporate Affairs	Consumer & Corporate Affairs
Education	Education	Education, Science & Technology	Education
			Universities, Science & Communications
Highways & Public Works	Highways	Transportation, Communi-cations & Highways	Transportation & Highways
Energy, Transport & Communications	Energy, Transport & Communications		
		Energy, Mines & Petroleum Resources	Energy, Mines & Petroleum Resources
Mines & Petroleum Resources	Mines & Petroleum Resources		
Finance	Finance	Finance	Finance
Forests	Forests	Forests	Forests

continued.....

B.C. Ministries Included in the Provincial Government Science Survey - Continued



B.C. Ministries Included in the Provincial Government Science Survey - Concluded

1980-81	1981-82	1982-83 (1)
Agriculture	Agriculture & Food	Agriculture & Food
Attorney General	Attorney General	
Consumer & Corporate Affairs	Consumer & Corporate Affairs	
Education	Education	
Universities, Science & Communications	Universities, Science & Communications	Universities, Science & Communications
Science Council of B.C.	Science Council of B.C.	Science Council of B.C.
Transportation & Highways	Transportation & Highways	Transportation & Highways
Energy, Mines & Petroleum Resources	Energy, Mines & Petroleum Resources	Energy, Mines & Petroleum Resources
Finance	Finance	
Forests	Forests	Forests
Health	Health	Health
Health Care Research Foundation	Health Care Research Foundation	Health Care Research Foundation
Human Resources	Human Resources	
Labour	Labour	

continued.....

B.C. Ministries Included in the Provincial Government Science Survey - Concluded

1980-81	1981-82	1982-83 (1)
Municipal Affairs	Municipal Affairs	
Lands, Parks & Housing	Lands, Parks & Housing	Lands, Parks & Housing
Environment	Environment	Environment
Provincial Secretary & Government Services	Provincial Secretary & Government Services	Provincial Secretary & Government Services
Tourism	Tourism	
Industry & Small Business Development	Industry & Small Business Development	

(1) Only Ministries having natural science activities were surveyed.

DEFINITIONS

This report covers those scientific and technological activities which involve the generation, dissemination and application of new scientific and technological knowledge. The central activity is research and experimental development (R & D). In addition, there are a number of related scientific activities (RSA) which are considered in less detail.

R & D is creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society and the use of this stock of knowledge to devise new applications.

It requires the acquisition of knowledge and not just information. New knowledge involves the integration of newly acquired information into existing hypotheses, the formulation and testing of new hypotheses or the re-evaluation of existing observations.

The major related scientific activities are technical surveys, statistical surveys, information services, special services and studies, and museum services. Statistical surveys, information services and museum services are largely self-explanatory.

Technical surveys are activities directed towards the exploration and systematic description of the earth and its natural resources. The activities include the gathering, processing, collating and analyzing of data on natural phenomena except when part of a research project or a museum service. The preparation of maps and survey reports, their printing and cataloguing, are also included.

Special services and studies in the natural sciences are activities directed towards the establishment of national and provincial standards for materials, devices, products and processes; the calibration of secondary standards; non-routine quality testing; feasibility studies and demonstration projects. In the social sciences, special services and studies are systematic investigations carried out in order to provide information needed for planning or policy formulation, including feasibility studies, and demonstration projects.

Five performing sectors are identified besides the B.C. Research Council. Intramural refers to the provincial ministry or agency performing a scientific activity. Industry is largely private corporations but also includes crown corporations with a commercial function (e.g., power utilities) and industrial research institutes not controlled by another institution. Universities cover post secondary educational institutions and affiliated teaching and research facilities. Hospitals and health organizations are health organizations such as the Heart Foundation and hospitals which do not belong to the universities sector. Other includes non-resident performers of scientific activities funded by the provincial government, as well as recipients not covered elsewhere such as the Federal Government, other provincial ministries and individuals.

Expenditures are either current or capital. Current expenditures include those costs for personnel, transportation and communications, information, professional and special services, rentals, purchased repair and upkeep, utilities, materials and supplies. Capital expenditures are those on the construction and acquisition of land, buildings, machinery and equipment. Total expenditures include current plus capital.

THE RESPONDENTS

Agriculture and Food - Co-ordinator: Grant Thompson (387-5121)

The main identifiable scientific activities are the Demonstration of Agricultural Technology and Economics (D.A.T.E.) and the Agricultural and Rural Development Subsidiary Agreement programs. Approximately 5% of the Ministry's operating budget and person years are attributed to information services.

Energy, Mines and Petroleum Resources - Co-ordinator: T. Chatton (387-1368)

Three different divisions are included in this ministry's science expenditures: Petroleum Resources, Mineral Resources and Conservation & Renewable Energy Branch. The Ministry's intramural expenditures are split fairly even between R & D and RSA (technical surveys). They also support special services and studies in the industry sector. The Conservation & Renewable Energy Branch have forecast a large increase in extramural expenditures for 1983-84.

Environment - Co-ordinator: Dr. Bandy (387-1161)

Dr. Bandy collected statistics from: Environmental Laboratory, Fish & Wildlife, Marine Resources, Surveys and Resource Mapping, Waste Management and Water Management. This Ministry is the largest performer of science expenditures in the B.C. Government. Technical surveys is the predominant activity.

Forests - Co-ordinator: Winston Wai (387-1215)

Seven different branches report scientific activities in this Ministry: Engineering, Inventory, Protection, Range Management, Research, Silviculture and Valuation. Forests is the largest performer of R & D in the B.C. Government of which 87% is performed intramurally.

Health - Co-ordinator: Bill Lawrence (386-3166)

Natural science activities have been identified in only one area of the Ministry of Health: Planning, Policy and Legislation. Most science activities of the Ministry are social sciences.

Health Care Research Foundation - Co-ordinator: Dr. M. Cairns (273-0788)

The Foundation makes awards available for the support of medical and health care research related to provincial problems.

Lands, Parks and Housing - Co-ordinator: Mr. T. Cockburn (387-5208)

The Housing Division, Parks & Outdoor Recreation Division and the Lands Division reported natural science activities this year. Major activities of this Ministry are technical surveys.

Provincial Secretary & Government Services
- Co-ordinator: Mr. R.Y. Edwards (387-3701)

The Provincial Museum is the only part of this Ministry involved in natural science activities. Major activity areas are R & D and museum services.

Science Council of B.C. - Co-ordinator: Catherine Graham (273-0788)

The Council makes awards for research projects, mainly to researchers in the universities and industry, although the B.C. Research Council also receives support. In addition, the Science Council has the Graduate Research Engineering and Technology (GREAT) Awards and the Industrial Post-doctoral Fellowship (IPDF) programs. The Research Secretariat of B.C. provides administrative services to the Science Council and coordinates the procedures for the granting programs of the Science Council and the Health Care Research Foundation.

Transportation and Highways - Co-ordinator: Mr. M.G. Elston (387-6742)

The Geotechnical and Materials Engineering Branch is the only part of the ministry performing natural science activities, mostly special services & studies.

Universities, Science and Communications - Co-ordinator: Barry Stevenson (387-1239)

The Ministry provides funds to the Science Council of B.C. as well as grants to the Discovery Foundation and the B.C. Research Council. Through the Science and Technology Division it also develops, plans and programs recommendations for science policy and develops an information base on scientific activities in the province.

Indicators of Provincial Scientific Activities

1. Population and Income

Province	Population January/83 (1)		Personal Income per capita 1981 (2)		Provincial Gross Domestic Product per capita 1981 (3)	
	(000)	Rank	($)	Rank	($)	Rank
Newfoundland	576	9	7,528	10	7,253	9
Prince Edward Island	124	10	7,829	9	7,104	10
Nova Scotia	857	7	9,041	7	8,581	8
New Brunswick	706	8	8,272	8	8,798	7
Quebec	6,478	2	10,661	5	12,090	6
Ontario	8,754	1	12,386	3	14,848	3
Manitoba	1,042	5	10,806	6	12,265	5
Saskatchewan	991	6	11,583	4	15,042	4
Alberta	2,341	4	12,779	1	19,742	1
British Columbia	2,801	3	12,538	2	15,168	2
Canada (4)	24,740		11,520		13,920	

(1) Canadian Statistical Review, Statistics Canada, Catalogue No. 11-003E, March 1983.
(2) National Income and Expenditure Accounts, 1967-1981, Statistics Canada, Catalogue No. 13-201.
(3) Provincial Economic Accounts, Experimental Data, 1966-1981, Statistics Canada, Catalogue No. 13-213.
(4) Includes the Yukon and Northwest Territories.

2. Universities

Province	Graduate students per ten thousand population (15 years and over) 1981-82 (1)	Rank	Sponsored research in universities per capita, 1981-82 (2) ($'000)	Rank
Newfoundland	13	7	20	6
Prince Edward Island	-	10	1	10
Nova Scotia	26	4	21	5
New Brunswick	10	9	14	8
Quebec	28	2	22	4
Ontario	29	1	26	2
Manitoba	26	3	33	1
Saskatchewan	12	8	9	9
Alberta	22	5	24	3
British Columbia	20	6	18	7
Canada	25		23	

(1) Full-time enrolment for graduate degrees, per ten thousand population (15 years and over) Universities Enrolment and Degrees, 1981-82, Statistics Canada, Catalogue No. 81-204, and Intercensal Estimates of Population by Sex and Age for Canada and the Provinces, June 1981, Population Estimates Section, Demography Division, Statistics Canada.

(2) Financial Statistics of Universities and Colleges, 1981-82, Statistics Canada.

3. Industry

Province	Value added by manufacturing industry per capita, 1980 (1)		Current intramural industrial R & D expenditures per employee in primary and secondary industry, 1981 (2)	
	($)	Rank	($)	Rank
Newfoundland	848	8	200	6
Prince Edward Island	633	10	--	10
Nova Scotia	1,394	7	66	8
New Brunswick	1,528	5	43	9
Quebec	2,834	2	570	3
Ontario	3,684	1	713	2
Manitoba	1,698	4	210	5
Saskatchewan	796	9	123	7
Alberta	1,442	6	847	1
British Columbia	2,345	3	221	4
Canada (3)	2,666		575	

(1) Manufacturing Industries of Canada; National and Provincial Areas, 1980, Statistics Canada, Catalogue No. 31-203.
(2) Results of 1981 Industrial R & D survey, Science and Technology Statistics Division, Statistics Canada and The Labour Force, April, 1983, Statistics Canada, Catalogue No. 71-001.
(3) Includes the Yukon and Northwest Territories.

4. Federal Government

Province	Expenditures on intramural natural science activities 1981-82(1)	Federal personnel 1981-82(1)	Contracts awarded by the Science Procurement Sector, Department of Supply and Services, 1982-83(2)	
	($'000,000)	Person-years	No.	($'000,000)
Atlantic Provinces	120	2,351	584	16
Quebec	76(3)	1,579(3)	403	48
Ontario	196(4)	4,614(4)	1,285	96
Ottawa-Hull	520	9,850	NA	NA
Manitoba	82	1,542	123	5
Saskatchewan	30	691	73	6
Alberta	55	1,293	179	9
British Columbia	74	1,606	690	32
Canada(5)	1,153	23,539	3,357	212

(1) "Federal Scientific Establishments, 1981-82", Science and Technology Statistics Division, Statistics Canada.
(2) Research and Development Bulletin, April 1983, Supply and Services.
(3) Excluding Hull.
(4) Excluding Ottawa.
(5) Includes the Yukon and Northwest Territories.

5. Provincial Research Organizations

Province	Total expenditures 1982 (1)	
	($'000)	Rank
Nova Scotia	5,684	6
New Brunswick	5,207	7
Quebec	18,456	3
Ontario	19,802	2
Manitoba	4,765	8
Saskatchewan	10,247	4
Alberta	37,135	1
British Columbia	8,522	5
Total	109,818	

(1) "The Provincial Research Organizations, 1982", Science Statistics, Vol. 7, No. 11, Statistics Canada, Catalogue No. 88-001.

6. Sectors Performing R & D, by Region, 1981(1)

Performing sector	Atlantic provinces	Quebec	Ontario	British Columbia	Other Western provinces	Canada (2)
	($000,000)					
Federal government ...	83	88	513	45	135	865
Provincial government	3	18	37	12	16	85
Provincial research organizations	3	10	14	2	23	52
Total government	89	116	564	59	174	1,002
Industry	18	449	1,073	98	333	2,004
Universities	72	233	286	82	155	828
Private non-profit ...	-	13	12	1	3	30
All sectors	179	812	1,935	240	665	3,864

(1) Science & Technology Statistics Division, Statistics Canada.
(2) Includes the Yukon and Northwest Territories.
NOTE: Totals may not add due to rounding.

7. Sectors Funding R & D, by Region of Performance, 1981 (1)

Funding sector	Atlantic provinces	Quebec	Ontario	British Columbia	Other Western provinces	Canada (2)
	($000,000)					
Federal government	112	216	750	84	201	1,368
Provincial government ..	7	66	86	23	79	258
Provincial research organizations	-	1	4	-	-	5
Total government	119	283	840	107	280	1,631
Industry	16	365	893	80	280	1,667
Universities	39	108	91	39	67	344
Private non-profit	2	22	36	6	10	76
Foreign	-	33	75	8	27	146
All sectors	179	812	1,935	240	665	3,864

(1) Science & Technology Statistics Division, Statistics Canada.
(2) Includes the Yukon and Northwest Territories.
NOTE: Totals may not add due to rounding.

POOR

QUALITY

ORIGINAL